IWMI
International Water Management Institute

Technical Brief

A gender perspective to understanding and enhancing the functionality of water supply systems in Nepal

Community-based water resources management has driven the Global South's rural water-related discourse since the 1970s, highlighting an increased interest in local participation to ensure the sustainability of water projects while also decreasing state intervention (Sultana 2009). This has resulted in the formation of water user groups (WUGs) that manage and decide on concerns related to common water sources and systems. The practice, however, is not without criticism, particularly in how concepts of 'community' (often seen as heterogeneous) and 'participation' (with limited understanding of unequal power relations that institutions perpetuate) play out (Sultana 2009).

Research on water system functionality is often limited to identifying the form and functioning of water user committees, fixating on water resources management as a techno-managerial exercise (Whaley and Cleaver 2017). Nepal has achieved considerable progress towards achieving national targets for the provision of access to water supplies. For example, 97% of the total population has access to basic sanitation facilities and 87% has access to basic water supplies (Budhathoki 2019). However, a study conducted in 2014 indicates that only 25% of water supply systems in place remain fully functional (Department of Water Supply and Sewerage 2014). Lack of functionality first affects the marginalized groups, particularly women and young girls, who are largely responsible for ensuring household water security. While institutional models such as water user groups/ committees have helped address the problem of ownership linked to water system functionality (White et al. 2015), there is growing interest in understanding how power relationships and history shape access to water resources (Mosse 1997; Franks and Cleaver 2007).

A woman accessing piped water for washing utensils in Dailekh district, Nepal (*photo*: Manita Raut).

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The project

The Nepal office of the International Water Management Institute (IWMI) is currently engaged in a research project – *A gender perspective to understand and enhance the functionality of water supply systems: Lessons from Nepal* – that explores how gender relationships and power dynamics influence the sustainability and functionality of water supply systems in the country. The aim of the project is to address a major limitation in current approaches to women's empowerment in the water sector, where the focus for both research and development interventions has been on women's individual empowerment, with inadequate attention given to collective action and collective empowerment.

As part of the ongoing work, this brief sheds light on the status of water system functionality in the project sites, mechanisms that govern these systems, and the extent to which these mechanisms are inclusive and promote gender equality and diversity. As part of the study, a survey of 600 households was carried out and additional qualitative inquiries were conducted in four rural municipalities – two each in Dailekh and Sarlahi districts in Nepal. Respondent sampling for the survey was conducted in three stages: (i) the required number of clusters were selected using the Probability Proportional to Size (PPS) method; (ii) 20 households were then selected from each cluster using the social mapping approach. The primary sampling unit (PSU) for the survey was the ward of the previously existing Village Development Committee (VDC); and (iii) the survey was conducted through face-to-face interviews. Qualitative information was collected through focus group discussions, key informant interviews, social and institutional mapping, and observation.

Status of water system functionality

Households' access to water supply infrastructure was mainly through self-supply[1] followed by community piped water infrastructure. The majority (89%) of households in Dailekh district used community water supply infrastructure, while over three-quarters (78%) in Sarlahi used self-supply infrastructure. Tube wells or boreholes were the main sources of drinking water for all the households in Sarlahi, while public tap/standpipe and piped water to the yard were the main sources for households in Dailekh. Each type of water supply infrastructure in Dailekh is managed by a separate WUG. Majority of the respondents stated that water from the current sources was only adequate for drinking, washing, and livestock watering (Figure 1).

While most of the water supply systems were functional in both the areas (92% was functional for piped water and 97% for public tap/standpipe), more than one-tenth of the tube wells/boreholes were reported to be nonfunctional. **In Dailekh, seasonal water fluctuations (unavailability) and breakage of infrastructure lead to nonfunctional water systems. In Sarlahi, poor water quality and the inability to afford government-constructed water systems were the causes for nonfunctional systems.** Almost all (99%) of the respondents in Sarlahi reported that either they themselves or their family members were responsible for operation and maintenance (O&M) of the tube wells and boreholes. Over half of the respondents indicated that they themselves were responsible for O&M of piped water and public tap/standpipe, while approximately 30% stated that the WUGs were responsible.

Key messages

- Water User Groups (WUGs) are supposed to be exemplary of community participation. However, meetings held by these groups were usually attended by the head of the household (90% men, overall), while the participation of female household members was found to be quite low.
- Rapid male out-migration increases the work done by women (household duties and agricultural activities), which could lead to their decreased participation in community decision-making platforms.
- Women from migrant households claimed that, even if they had sufficient funds to purchase pipes to access water from smaller sources within the village, they did not have the technical knowledge needed to construct the pipes.
- Respondents to the survey stated that they prioritized improved water infrastructure and improved water quality, followed by increased water availability, and reductions in or exclusions from the payment of tariffs (the lowest priority because only 13% of all respondents paid tariffs).
- In Musahar (extremely marginalized Dalit) households in the municipality studied in Sarlahi, poverty runs so deep that they have had to reject piped water from the overhead tank (currently under construction), as they have no space to install taps and get connected to a piped system.
- Payment of water fees is also a challenge for poorer communities.
- Women view the government's reservation policy that allowed their historical inclusion in politics in a positive manner. However, they also find themselves challenged by the dominant male-centric political system, with its insufficient understanding of gendered power relations hindering women's exercise of power.

[1] Self-supply refers to systems mainly financed by the users themselves, based on products and services they require (Rural Water Supply Network [RWSN] - https://www.rural-water-supply.net/en/self-supply).

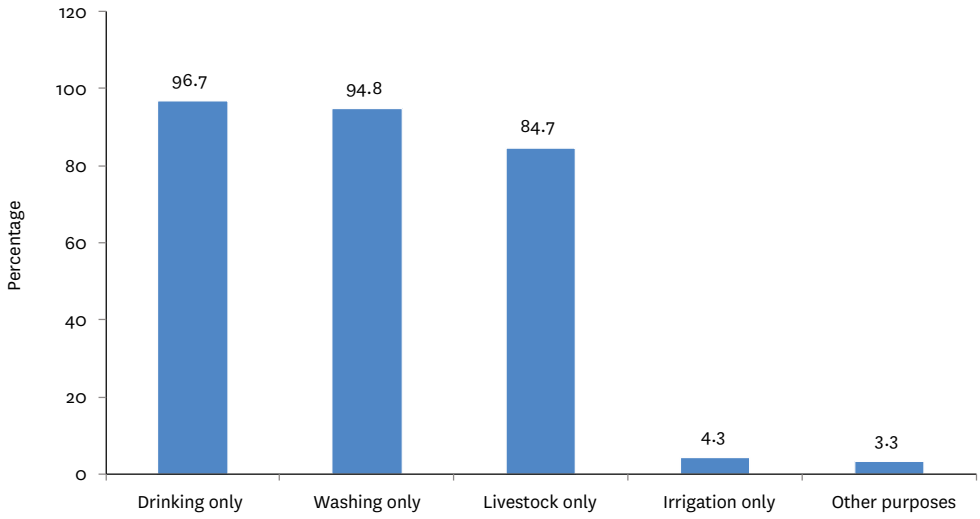

Figure 1. Distribution of respondents based on the availability of water for different purposes in Dailekh and Sarlahi districts in Nepal.

The survey found a marked difference in the contribution made by households (in terms of labor and cash) towards O&M of their water supply systems. For instance, in the hilly area of Dailekh, where infrastructure managed by the community is predominant, almost all the households had contributed labor while only 26% contributed cash. Similarly, in Sarlahi, a significantly higher number of respondents (91%) contributed cash, and as much as 85% contributed labor (Figure 2). This is because private tube wells are the predominant source of water in Sarlahi. Thus, people themselves are responsible for the O&M of their systems.

The most frequently cited challenges faced by the respondents in O&M of community water supply systems were related to the lack of funds, followed by the unavailability of technicians, plumbers and mechanics, and the low quality of the construction of the system. A twelve-country study[2] also finds that, among several other factors, financial contributions by water users made a significant impact on whether water supply systems remained functional or not, and whether any local water management unit, particularly village water committees, existed at the ground level (Wiles and Mallonee 2017).

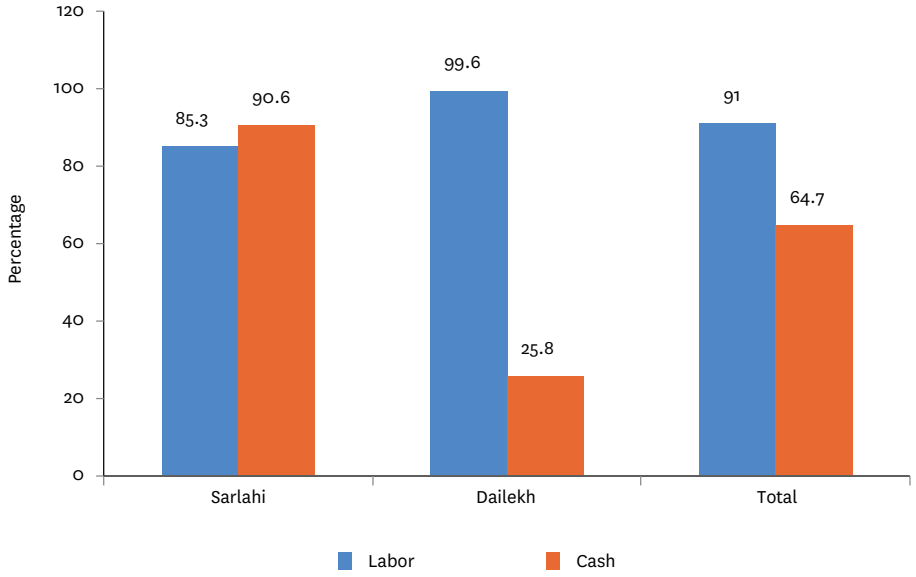

Figure 2. Contribution made by households (in terms of labor and cash) towards the operation and maintenance of water supply systems in Dailekh and Sarlahi districts in Nepal.

[2] A total of 3,815 communal water systems installed in El Salvador, Ethiopia, Ghana, Guatemala, Haiti, India, Kenya, Mexico, Nicaragua, Rwanda, Uganda and Zambia (Wiles and Mallonee 2017).

Water User Groups

Community water supply systems, managed through WUGs, are founded on strong democratic norms and values. In Nepal, the Water Resources Act (1992) formally enabled the collective use of water sources through the formation of a water users' association, also known as a water user group (WUG). These WUGs are tasked with O&M of water supply systems and given powers to levy water tariffs based on service. A significant percentage of respondents, higher in Dailekh than in Sarlahi (50% versus 11%), reported that a WUG existed in their community. Eighty-seven percent of respondents in Dailekh and only 2.5% in Sarlahi belonged to such a group. This is due to the greater reliance of Dailekh on common water sources compared to Sarlahi. Almost all the WUGs (except for one in Sarlahi) were formed by the communities themselves.

WUGs are to be emblematic of community participation. However, meetings held by these groups were usually attended by the head of the household (90% men, overall), while the participation of female household members was found to be quite low; less than 8% of the respondents mentioned that the spouses of household heads or their daughters-in-law had attended a WUG meeting. While WUGs are mandated to have a representation of at least two women out of the nine member group according to the Drinking Water Rules 1998, its application was mostly tokenistic. Women were mostly seen in the role of 'treasurer' and, on several occasions, husbands seemed to be making decisions on behalf of their wives. This is despite the fact that the burden of water scarcity (related to fetching, cooking and other uses) fell disproportionately on women.

The survey revealed that respondents prioritized improved water infrastructure (32.5%) and improved water quality (32%), followed by increased water availability (19%) and reductions in or exclusions from payment of tariffs (the lowest priority). Only 13% of all respondents stated that they pay a tariff for the water source (78 affirmative responses in Dailekh and only one in Sarlahi); this, again, is attributable to the fact that more respondents in Dailekh depend on community water infrastructure than in Sarlahi. On average, each household paid NPR 48 monthly (approximately USD 0.5), and payment of the tariff was done on a regular basis by those who paid.

Marginalized groups in Dailekh reported that these WUGs met only to collect tariffs when the water supply in the Dalit village had been in disrepair for the last several months. Lack of information on work carried out by WUGs and decisions made were not well relayed to Dalit communities, even though the secretary of one of these groups was an elected Dalit leader. Studies show that the functionality of water supply systems was better when fees were collected on a routine monthly basis rather than collecting fees after the system had broken down (Cronk and Bartram 2017).

A woman collecting water for domestic use from a communal tap in Dailekh district, Nepal (*photo:* Manita Raut).

Twenty-six percent (all from Dailekh) cited conflicts within the WUG in the last 12 months. Misuse of funds (85%), conflicts over repair and maintenance (56%), sharing and distribution of water (22%), and water quality (19%) were further cited as the main causes of conflict. Sarlahi did not experience such conflicts due to its reliance on self-supply infrastructure.

Key issues and challenges

Poverty versus access to water supply systems and their functionality

In Musahar[3] households of Sarlahi, poverty runs so deep that they have had to reject piped water from the overhead tank (currently under construction), as they have no space to install taps and get connected to a piped system; their small mud and stone homes stand on very little land.

The settlement has a long history of difficulties in gaining access to water. The first set of six hand pumps was installed at a depth of only 60 feet (18.288 meters) with assistance from the United Nations Children's Fund (UNICEF) in 1983. These pumps supplied unsafe water contaminated with arsenic, iron and pathogens. The water was used for drinking purposes, while common pond water was used for bathing and washing. None of these pumps are in operation today.

The water pumps installed by UNICEF were placed on government-owned public land. Later, another set of six pumps was installed on land privately owned by a local micro-credit organization, citing lack of repair and maintenance of the communal pumps. The owner of these new pumps had to maintain them and provide access to water for his/her neighbors. Currently, there are six shared hand pumps, each serving 30 to 35 households. Four of these donated common hand pumps are located in the Musahar community. This is different in comparison to the rest of the village, where most of the hand pumps are private with sufficient land for pump installation.

Payment of water fees is also a challenge for poorer communities. These households stated that they could not afford to pay the initial deposit of NPR 1,200 (approximately USD 10) per household and the monthly tariff of NPR 40 (approximately USD 0.35) for the overhead tank being constructed. Discharge from the overhead tank was calculated at a utilization rate of 65 liters per head per day, with this amount covering the water needed for drinking, sanitation, livestock and irrigation.

Dalit households did not have large containers to save water and, as a result, had to repeatedly fetch water from the community hand pump. Often, it was difficult for women to fetch water from the common hand pump during the night.

Social discrimination based on caste is still prevalent in the community. Dalit families live separately in three to four close clusters in both areas, with only a few Musahar households in Sarlahi living close to the rest of the larger community. Installation of pumps at a depth of 150 feet (45.72 meters) below the ground to gain access to arsenic-free water comes at a cost. In one of these clusters in Sarlahi, the Musahar community is compelled to either use pumps dispensing unsafe water from a depth of only 20 feet (6.09 meters) (installed previously by a local political party) or share the limited number of pumps dispensing 'safe water' from a depth of 150 feet. A few better-off Dalit households that can afford these costly pumps do not always want to share them. In some instances, political parties have installed water pumps when an election is approaching; however, these were shallow hand pumps dispensing unsafe water. The Musahar community lives in the far end of the village; this geographical distancing from the mainstream community implies that they are still not fully welcome into the larger community.

The study site in Dailekh had a separate small Dalit dwelling that was often subject to implicit or indirect discrimination rather than direct discrimination. Although caste discrimination was outlawed in Nepal in 1963, excluding Dalits from water use and access now exists in a more complex space where they are not able to fully exercise their water rights. Their water insecurity is made worse by their lack of economic and social capital, which often prevents them from gaining access to water services and also institutions (Shrestha et al. 2020).

Effects of migration on water resources management

Migration in Nepal is common for young men, and increasingly women, who leave in search of better opportunities overseas. The survey revealed that a little over one-tenth of family members, with a slightly higher proportion in Dailekh compared to Sarlahi (17% versus 10%), were living away from their homes. **Field observations show that rapid male out-migration increases the work done by women (household duties and agricultural activities), which could lead to their decreased participation in community decision-making platforms.** This is particularly the case in nuclear families, where women have to give priority to their work over participation in community meetings.

In relation to access to water, women from migrant households claimed that, even if they had sufficient funds to purchase pipes to access water from smaller sources within the village, they did not have the technical knowledge needed to construct the pipes. The head of the household was mainly responsible for O&M of the water source, followed by the household head's son (11%) and spouse (8%). A very small proportion of female household members (1% of daughters in Dailekh and none in Sarlahi, 3% daughters-in-law in Dailekh compared to 1% in Sarlahi) were found to be involved in the repair and maintenance of water sources in the study areas.

[3] Musahars are a subgroup under the Dalit category of the southern plains (called Madheshi or Tarai Dalits), and are among the most impoverished communities in the country. For a detailed caste classification in Nepal, see Bennett et al. (2008).

Local governance and the gender dynamics of representation

Local governments now have a substantial role in and powers over local water supply management, including the formulation and implementation of water-related plans and policies. With Nepal having embraced federalism in September 2015, the country now has a historic number of women and disadvantaged communities in political positions, with women accounting for about 40% of those represented in local governments (Limbu 2018). At least 14,000 women were elected across local-, provincial- and federal-level governments, which is the highest number of women ever to be elected to public office in the country (Baruah and Reyes 2017). Membership into the smallest unit – the ward office under the local government – mandates that at least two of the four ward members must be women, and one must be from a historically marginalized community (Baruah and Reyes 2017).

Women view the government's reservation policy that allowed their historical inclusion in politics in a positive manner. However, they also find themselves challenged by the dominant male-centric political system, with its insufficient understanding of gendered power relations hindering women's exercise of power (Yadav 2020). The government mandates for women to be elected either as the Chair or Deputy Chair of local governments, but parties mostly relegated women to deputy positions during the local elections of 2017. Deputy chairs or deputy mayors in local governments have nine different important functions, including coordinating the judicial committee, according to the Local Government Operation Act 2017. However, they are not sufficiently supported with the required skills. According to The Asia Foundation (2018), 53% of women representatives indicated that they faced challenges at work (e.g., struggling with technical- and knowledge-based work regarding existing government policies, and 48% of these representatives reported that they did not know how to tackle these challenges. **In the Rural Municipality studied in Sarlahi, the female Deputy Chair had been effectively replaced by her husband, who made all the important decisions related to conflict management and social development in her stead.** Men in leadership positions in the field opined that 'the inclusion of women was a legal compulsion' and little else. With a history of having worked in the community water sector, a leader of a nongovernmental organization in Sarlahi stated that women elected to water user committees were 'dummies', because either their husbands or male members of the committee prompted them during decision-making.

As to whether the advent of federalism had brought any tangible changes to water access and water quality, only 8% of respondents, higher in Dailekh (18%) than in Sarlahi (1%), observed positive changes (Figure 3). Newly elected local governments have prioritized the construction of roads, public school maintenance and irrigation over other projects (especially in Sarlahi, where two-thirds of their budgets are allocated to these areas), causing fewer respondents to view their local governments positively in relation to concerns over drinking water. Local governments elected in 2017 are also in the process of trying to find their footing in the new heavily decentralized system, and they would need more time to effectively address local concerns.

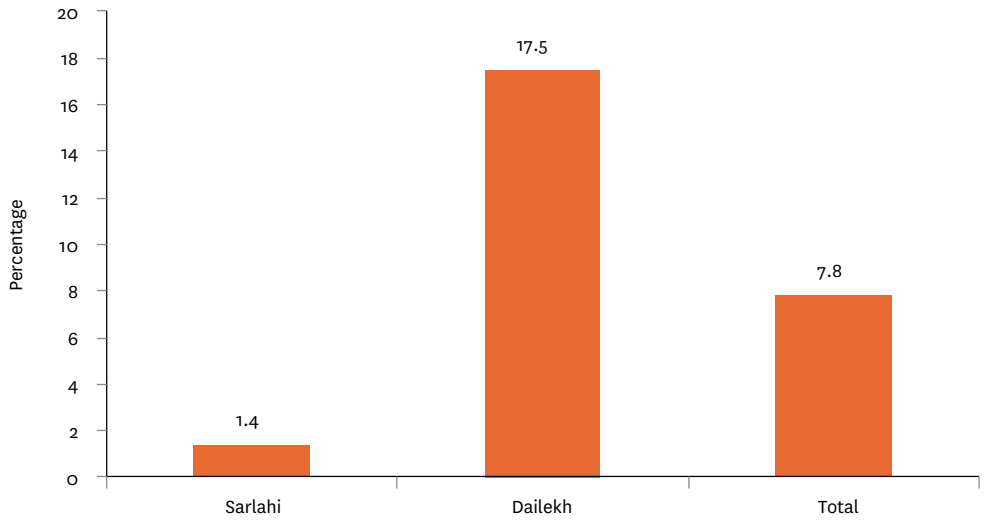

Figure 3. Positive changes to water access and water quality brought about by federalism, as observed by respondents in Dailekh and Sarlahi districts in Nepal.

Conclusion

This early stage of research has highlighted a number of important factors that will need to be studied and analyzed further. The functionality of rural water supply systems is a common issue across regions, including our study sites in Dailekh and Sarlahi districts in Nepal. However, factors that result in nonfunctional water systems are contextually different.

Women and young girls are largely responsible for household food security. Male out-migration has increased women's responsibilities, both at home and on the farm. However, this has not led to women becoming active decision-makers in elected bodies and WUGs. This is despite a space being created for women legally in institutions such as WUGs, and due to increased male out-migration. With local governments now in place, and the historic inclusion of women and marginalized communities in politics, there are many avenues for women to challenge the existing power hegemony and assert their space.

It could also lead to greater recognition of gender equality and social inclusion (GESI) concerns in projects overseen by them. Additionally, training local governments on the need for GESI mainstreaming and giving them space to incorporate these ideals into their policies could contribute to positive change.

Marginalized communities have been at the receiving end of poor services, which are often caused by a lack of social and economic capital. Historical marginalization, coupled with landlessness and poverty, limits their access to safe water supplies. Local governments and WUGs need to work together to find solutions to the problems faced by these marginalized communities, such as lack of access to water and the inability to pay water fees. Local leaders need to understand how to incorporate these priorities into their plans, and more importantly, how to involve the entire community to successfully visualize and implement it.

A shared hand pump constructed for extracting groundwater at a depth of 150 feet (45.72 meters) to be used for drinking in Sarlahi district, Nepal (*photo:* Manita Raut).

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Source

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Project

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